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Notice of Allowability	Application No.	Applicant(s)	
	10/648,482	JOEI, MASAHIRO	
	Examiner	Art Unit	
	Lynne A. Gurley	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the interview summary of 4/28/04 and Attorney's approval given 5/10/04.
2. ☒ The allowed claim(s) is/are 1-10.
3. ☒ The drawings filed on 27 August 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date <u>5/10/04</u> 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|--|---|


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ramyar M. Farid on 5/10/04.

The application has been amended as follows:

In the Claims:

1. (Currently amended) A method for fabricating a semiconductor device comprising the steps of:

forming an insulating film on a conductive pattern formed on a substrate;

forming a resist pattern on the insulating film;

performing etching to the insulating film using the resist pattern as a mask to form in the insulating film an opening at which part of a surface of the conductive pattern is exposed;

forming, by performing oxygen plasma treatment, a passive antioxidant layer on the part of the surface of the conductive pattern exposed while removing the resist pattern; and

depositing a conductive film on the conductive pattern from which the antioxidant layer has been removed,

wherein the antioxidant layer contains CuO as a main component.

2. (Currently amended) The method of claim 1, wherein the conductive pattern contains Cu and ~~the antioxidant layer contains CuO as a main component.~~

3. (Previously presented) The method of claim 2, wherein the step of forming an antioxidant layer includes performing oxygen plasma treatment with a substrate temperature of 120°C or less.

4. (Original) The method of claim 2, wherein the step of forming an antioxidant layer includes performing oxygen plasma treatment with a chamber pressure of 40 Pa or less.

5. (Currently amended) A method for fabricating a semiconductor device comprising the steps of:

forming an insulating film on a conductive pattern formed on a substrate;

forming a resist pattern on the insulating film;

performing etching to the insulating film using the resist pattern as a mask to form in the insulating film an opening at which part of the surface of the conductive pattern is exposed;

forming, by performing oxygen plasma treatment, a passive antioxidant layer on the part of the surface of the conductive pattern exposed;

after forming the antioxidant layer, removing the resist pattern by performing oxygen plasma treatment; and

depositing a conductive film on the conductive pattern from which the antioxidant layer has been removed,

wherein the antioxidant layer contains CuO as a main component.

6. (Currently amended) The method of claim 5, wherein the conductive pattern contains Cu and ~~the antioxidant layer contains CuO as a main component.~~

7. (Previously presented) The method of claim 6, wherein the step of removing the resist pattern includes performing oxygen plasma treatment with a substrate temperature of not less than 200°C and not more than 250°C.

Art Unit: 2812

8. (Original) The method of claim 5, wherein the step of forming an antioxidant layer includes performing oxygen plasma treatment with a first substrate temperature, and
the step of removing the resist pattern includes performing oxygen plasma treatment with a second substrate temperature which is higher than the first substrate temperature.
9. (Original) The method of claim 5, wherein the step of forming an antioxidant layer includes performing oxygen plasma treatment at a first pressure, and
the step of removing the resist pattern includes performing oxygen plasma treatment at a second pressure which is higher than the first pressure.
10. (Previously presented) The method of claim 5, wherein the step of forming the antioxidant layer includes performing reactive ion treatment to the conductive pattern.

Reasons For Allowance

2. The following is an examiner's statement of reasons for allowance: The closest prior art of record fails to teach or to suggest, that "the antioxidant layer contains CuO as a main component".

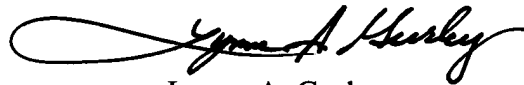
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2812

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Lynne A. Gurley', with a large, stylized loop at the beginning.

Lynne A. Gurley
Primary Patent Examiner
TC 2800, AU 2812

LAG
May 10, 2004